REMARKS

Prior to entry of this amendment, claims 1-6 were pending in the application. Claims 1, 3, 5 and 6 were rejected and claims 2 and 4 were objected to as being dependent upon a rejected base claim. By this amendment, claims 3, 5 and 6 have been canceled, claim 1 has been amended, and claims 2 and 4 have been rewritten into independent form. Accordingly, claims 1, 2 and 4 remain pending in the application for further consideration by the Examiner.

Allowable Subject Matter

Applicants appreciate the Examiner's favorable consideration and indication that claims 2 and 4 would be allowable if rewritten into independent form to include all limitations of the base and intervening claims. Claims 2 and 4 have been rewritten into independent form accordingly and therefore stand in condition for allowance.

35 U.S.C. 102(b) Rejection

Claims 5 and 6 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,621,299 ("Krall"). Because claims 5 and 6 have been canceled by the foregoing amendment, this rejection is now deemed to be moot.

35 U.S.C. 103(a) Rejection

Claims 1 and 3 were rejected under 35 U.S.C. §103(a) as being obvious over APPLICANTS' PRIOR ART ("Admitted Prior Art") in view of Krall. Claim 1 has been amended and claim 3 has been canceled. Applicants submit that claim 1 is patentable over the combination of the Admitted Prior Art and Krall for the reasons set forth below.

According to the principles of Applicants' invention, a power supply is provided which is capable of supplying an output voltage having a tolerance that was previously unattainable, or attainable only at unacceptable expense. Conventional power supplies are normally controlled to within ± 5% or ± 10%, but for critical applications, particularly in the optical telecommunications field, control to within ± 2% or better is required.

In a conventional power supply, as illustrated in FIG. 1 of the present application (Admitted Prior Art), and also as output circuit 19 in FIG. 1 of Krall, a signal representative of the output voltage of a DC/DC converter is derived and used to control the DC/DC converter. Typically this is done by means of a resistive voltage divider (see, e.g., elements 12, 13 in Applicant's FIG. 1; elements 71, 73 in FIG. 1 of Krall).

In contrast to these prior arrangements and as set forth in Applicants' claim 1, a correction signal is produced by processing a digital signal representative of the voltage applied to the load, and this correction signal is combined with the derived signal representative of the

output voltage of the DC/DC converter. The use of the correction signal in combination with the derived signal enables for more precise control of the voltage applied to the load.

Briefly, Krall discloses a conventional power supply as item 19 (FIG. 1) having essentially the same structure as that shown in Applicant's FIG. 1 (Admitted Prior Art). Since Krall's power supply is for use with a variety of pieces of equipment (see, e.g., col. 1, lines 56-59), the voltage divider 71, 73 of Krall includes one variable resistance arm 73 to enable a voltage to be selected by the user (see col. 5, lines 6-18). Krall also discloses, as noted by the Examiner, an alternative power supply 19' (FIG. 7). In this power supply, an A/D converter 94 forms a digital representation of the voltage at the terminals 31 to which the load is connected. This digital representation is applied to a processor 95, which derives a digital output signal that is then converted to an analog signal by a D/A converter 97. This analog signal is applied as a control signal to the DC/DC converter 65 instead of the voltage produced by the voltage divider 71, 73 of FIG. 1. The processor also controls a switching network 93. In use, the processor initially opens the switching network 93, so the digital representation applied to the processor is of a voltage produced by an internal battery 109 of the equipment 107 which will form the load. This is taken as an indication of the magnitude and polarity of the voltage that is required by the equipment 107 (see col. 14, lines 14-23). The processor then, through the D/A converter 97, sets the control voltage applied to the DC/DC converter so that it provides that required voltage and closes the switching network 93 in such a way as to provide the required polarity (col. 8, lines 24-34).

Krall does not disclose or even suggest combining the features of his output circuit 19 of FIG. 1 (also Applicants' FIG. 1) with those of his output circuit 19' of FIG. 7. In fact, these are clearly described as alternative forms. In particular, Krall states at col. 7, lines 53-59:

> Referring to FIG. 7, a **modified** output circuit 19' is shown. Elements of the circuit of FIG. 7 which are the same as those within the output circuit 19 of FIG. 1 are given the same reference number. But **Instead of** a manual voltage adjustment 73, as shown in FIG. 1, a control integrated circuit chip 91 and a semiconductor switching network 93 are **substituted**.
> **[emphasis added]**

Also, Krall states at col. 8, lines 32-34:

> Thus, the manual adjustments of the output circuit 19 of FIG. 1 are rendered automatic by the substitute output circuit 19' of FIG. 7.

Thus, it is quite clear that Krall views the forms of circuits 19 and 19' to be alternatives. There is also a compromise form of output circuit, described in col. 8, lines 35-49, which states:

> As an alternative to the fully automated circuit of FIG. 7, a measurement of the voltage and polarity of the battery 109 may more simply be displayed to the user who then, in response, manually makes the voltage and polarity adjustments. In this variation, the **controller 91 and switching circuit 93 are eliminated**. They are replaced by a voltmeter that is connectable across the output terminals 31 through a momentary contact switch that also simultaneously disconnects the terminals 31 from the rest of the power supply circuit. The circuit of the resistor 71 and the potentiometer 73 (FIG. 1) are retained so that the user may adjust the potentiometer 73 in response to the voltmeter reading. The polarity of the connection of the device 107 to the power supply output terminals 31 is controlled by manually reversing the contacts. **[emphasis added]**

Thus, when making a power supply that falls somewhere between that shown as 19 of FIG. 1 (which is essentially that shown in Applicants' FIG.1) and that shown as 19' of FIG. 7, Krall omits the controller 91, i.e., the A-to-D converter 94, the processor 95, and the D-to-A converter 97 (see FIG. 7). Therefore, Krall fails to disclose or suggest the combination of:

- "a means for deriving a signal representative of the voltage supplied at the output, and a control circuit for controlling the voltage at the output in dependence upon the derived signal"; **and**
- "means for deriving a digital representation of the voltage at the load; a processor for deriving a digital correction signal from the digital representation; means for converting the digital correction signal to an analog correction signal",

as recited in Applicants' claim 1. Furthermore, since Krall does not disclose any combination of "analog correction signal" with "derived signal", Krall therefore also fails to teach or suggest a "means for combining the analog correction signal with the derived signal" as recited in Applicants' claim 1.

Furthermore, Krall does not teach or suggest improving the tolerance of the voltage supplied to the load as set forth in Applicants' claim 1. According to Krall, the purpose of introducing the controller 91 of FIG. 7 is not to improve the tolerance, but to automate the setting of the voltage in a "power supply that is adaptable for use with a wide variety of types of portable electronic equipment and various types of power sources" (see col. 1, lines 58-60).

By contrast, Applicants' claimed invention has a different purpose, namely to provide a power source that produces a voltage having an improved tolerance, suitable for use with equipment that demands such close tolerance, and which is achieved by a combination of features that Krall never contemplates.

As set forth in detail above, Applicants' claim 1 recites a combination of features that are not at all taught or suggested by Krall. At most, Krall discloses certain of the features separately and only as alternatives. A person of ordinary skill in the art, upon reading Krall and being

familiar with the prior art, such as that shown in Applicants' FIG. 1 (which is also disclosed in Krall), would not have been motivated to combine the features in the manner now being claimed by Applicants without the benefit of impermissible hindsight. Only the Applicants have disclosed that the tolerance of a power supply may be improved by a combination of features as set out in claim 1. Krall discloses no such teaching or suggestion, nor does any combination or improvement derivable from Krall, either alone or in combination with the Admitted Prior Art.

Accordingly, Applicants respectfully submit that claim 1 is patentable over the combination of Krall and the Admitted Prior Art and therefore request that the Examiner withdraw the rejection of claim 1 under 35 U.S.C. §103(a).

Conclusion

In view of the foregoing, Applicants believe that all pending claims stand in condition for allowance. Accordingly, Applicants respectfully request reconsideration of the application and passage of the case to issue. Any questions can be directed to the Applicants' attorney at the number below.

Respectfully submitted,

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